IN THE DRAWINGS

Please consider and approve the accompanying replacement figure 3 and new figures 9, 9a, 9b, 9c and 10.

REMARKS

This application pertains to a novel diaphragm pump, having a variable stroke volume.

Claims 1, 2, 4- 20, 22 and 24-29 are pending, claims 3, 21 and 23 being canceled by this amendment. The limitations of claim 3 have been added to claim 1.

Claim 22 has been withdrawn from consideration as drawn to a non-elected invention, so that the claims under consideration are therefore claims 1-20 and 24-29. It is respectfully requested that the non-elected claim be rejoined with the elected claims upon allowance of elected subject matter.

Applicants note the suggested arrangement of the specification. The specification as filed does, however, already include headings. It is therefore believed that no amendments are required with respect to the arrangement of the specification.

The disclosure stands objected to for several reasons, each of which is more specifically discussed in the office action. Each of the issues raised in this objection are addressed as follows:

The Examiner indicates that on page 2, line 9, "electropnuematically (sic)" is misspelled. In the specification, the word is actually spelled as "electropneumatically",

which is believed to be a correct spelling. If the Examiner sees a spelling error in this word, he is respectfully requested to more specifically point it out.

The Examiner indicates that on page 2, line 29 and page 3, line 27, the expression "adjusted (1003)" is not understood. The drawings (and the text at page 5, lines 5-7), however, make it very clear that "1003" is an adjusting wheel or knob, by which the axial disc is adjusted. Therefore, those skilled in the art will understand that the "(1003)" in the expression "adjusted (1003)" simply refers the reader to the mechanism by which the adjustment is made.

The Examiner indicates that the expression "decentral control unit" on page 4, line 9, is not understood. The expression is actually on line 8, not line 9. In any case, the decentral control unit is discussed in detail at page 15, lines 6-27. From this discussion, as well as the illustration in Fig. 1, those skilled in the art will understand that the decentral control unit is a control unit that is separate from but connected to the pump. More specifically, it is not integrated directly into the pump itself. This enables one pump head to be disconnected from the control unit and replaced by another pump head, using the same control unit.

The Examiner has pointed out an error on page 12, lines 5 and 6 (actually, lines 1 & 2), wherein commas were used instead of decimal points. This has now been corrected.

The Examiner indicates that on page 30, bottom paragraph (actually, page 31,

bottom paragraph), it is not understood what is meant by "chambered diaphragm" in that no chamber is seen; and also that Fig. 3 does not appear to show different operating states.

The chambered diaphragm is explained at page 7, lines 5-9 and in more detail at page 31, line 29 through page 32, line 19; especially with reference to Fig. 3 and chamber elements 1100 and 1101. From these discussions, those skilled in the art will have no trouble understanding what is meant by "chambered diaphragm".

With respect to the different operating states referred to at page 31, line 30 - page 32, line 32, Applicant now submits a corrected fig. 3 for review and approval by the Examiner. The corrected figure illustrates the two different operating states referred to in the specification. No new mater is added, as the drawing merely illustrates that which is described in the specification.

If the Examiner will indicate his approval, a formal corrected drawing will be submitted to the Official Draftsperson.

The objection to the disclosure should therefore now be withdrawn.

The drawings stand objected to because the chamber shaped as a truncated cone, as recited in claim 1 and the elastic material comprised of at least two interconnected material layers, as recited in claim 25, are not shown. Applicants submit

herewith proposed new Figs. 9, 9a, 9b, 9c and 10, which illustrate the truncated cone and elastic material, respectively. These proposed new drawings do not constitute new matter, as they merely illustrate that which is already described in the specification.

If the Examiner will indicate his approval of the proposed drawings, formal drawings will be submitted to the official draftsman.

The Brief Description of the Drawings is being amended to include descriptions of the new drawings, in anticipation of the Examiner's approval of the new drawings.

The proposed new drawings are believed to overcome the objection to the drawings, and the objection should accordingly now be withdrawn.

Claims 12, 13, 14 and 26-29 stand rejected under 35 U.S.C. 112, first paragraph, because the Examiner views claims 12 and 13 as reciting a combination of a pump and a distributor valve, and does not see any disclosure of a pump having a valve. The Examiner may be misreading claims 12 and 13. These claims do not recite a pump **and** a valve; they merely recite a distributor valve having the structure of the pump head of claim 1. More specifically, the pump head of claim 1 can be used as a distributor valve. This use is described in detail in Example 6. Accordingly, the claimed distributor valve is fully disclosed in the specification, and the rejection of claims 12 and 13 under 35 U.S.C. 112, first paragraph, should now be withdrawn.

With respect to claim 14, it will be clear from the language at page 11, line 13

and 14, that the expression "thermally controllable" means that the temperature of the outer plate is controllable, such as by heating or cooling. It is well known to those skilled in the art that for certain applications it is desirable to heat, cool or otherwise control the temperature of pumping apparatus.

Regarding claims 26-29, the Examiner views the specification as failing to define how the percentage of deformation is defined. The determination of the percentage deformation is explained at page 18, lines 11-25, Example 8 and Fig. 8. If the Examiner will specifically take a look at the last two paragraphs of page 38 (part of Example 8), he will see that the cord length was 26 mm, the arc length was increased to 35 mm, and the deformation was calculated to be 34.6 % (35/26 = 1.346).

From the language, figure and Example mentioned above, it is clear that any person having any degree of skill at all will have no trouble understanding how the percentage deformation is defined and calculated.

The rejection of claims 12, 13, 14 and 26-29 under 35 U.S.C. 112, first paragraph, should accordingly now be withdrawn.

Claims 1-21 and 23-29 stand rejected under 35 U.S.C. 112, second paragraph, for various reasons indicated more specifically in the office action. Each of the issues raised in this rejection are addressed in the following comments:

The Examiner views the recitation of "Multipart pump head" in the preamble of

claim 1 as confusing, as he views the remainder of the claim as being drawn to a pump. The claim is, however, clearly drawn to a pump head. A pump head is the major part of a pump, but it is nevertheless an individual component. As evidence of this, Applicants enclose copies of advertisements of Rose Scientific Ltd. and Fluid Metering, Inc., both of which were obtained via an Internet search, and both of which advertise pump heads.

With respect to the difference between a spherical segment and a spherical zone, as recited in claim 1, line 6, those skilled in the art will understand that a spherical segment is a piece of a sphere which is cut off of the sphere; whereas a spherical zone is a piece of a sphere which is cut out of the sphere, such as, for example, a slice. Should the Examiner desire, Applicants would be pleased to submit a drawing illustrating this difference.

Regarding the relationship between the inlet duct, the connecting ducts and outlet duct recited in claim 1, lines 11 and 12, the claim has now been amended to recite their relationship.

The reference number following the term "adjustable" in claim 1, line 19, has now been canceled.

The term "decentral electropneumatic control unit" recited in claims 1, 16 and 19 will be clearly understood by those skilled in the art based upon their own skills as well as upon a reading of the specification, as discussed above.

With respect to claim 7, this claim merely recites alternative limitations regarding the shape of the movable disc. Such alternative limitations are frequently expressed in the form of a Markush group, but it is also acceptable to recite them simply as alternatives (See MPEP 2173.05(h)(I)).

The meaning of "chambered diaphragm", and the fact that the term will be readily understood by those skilled in the art, is discussed above.

Claim 9 has been amended to cancel the duplicitous recitation.

As discussed above with respect to the same issue raised in the 35 U.S.C. 112, first paragraph, rejection, claims 12 and 13 recite a distributor valve having the structure of the pump head of claims 11 and 1 respectively. More specifically, the pump of claim 11 and the pump head of claim 1 can each be used as a distributor valve. It is clear that in claim 12 Applicants are claiming a valve which comprises the structure of claim 11 and that in claim 13 Applicants are claiming a valve which comprises the structure of claim 1.

With respect to claim 14, those skilled in the art will understand that the "thermal control" of the outer plate means that the outer plate is temperature-controlled, such as by heating or cooling, as discussed at page 11, lines 13-14.

With respect to claim 15, the expression "hydraulic diameter' is a well-known engineering expression. As evidence of this, Applicants are enclosing a paper entitled

"Heat exchanger calculations" obtained over the internet, which provides a sample calculation of hydraulic diameter.

Claims 21 and 23 have been canceled.

With respect to claim 24, it should be noted that a conventional expression of alternative limitations, such as those of claim 24, is specifically permitted by MPEP 2173.05(h)(I).

Regarding claims 26-29, the meaning and calculation of percentage of maximum deformation is clearly explained in the specification, as discussed above with respect to the 35 U.S.C. 112, first paragraph, rejection.

The rejection of claims 1-21 and 23-29 under 35 U.S.C. 112, second paragraph, should therefore now be withdrawn.

Claims 1-6, 8, 9, 11, 16, 17, 18, 21, 23 and 26-29 stand rejected under 35 U.S.C. 103(a) as obvious over Nystroem (US 3.741,687) in view of either Getgheluck (FR 1,457,419) or Carver (FR 1,177,065). One of the essential features of Applicants' novel pump, as shown in Fig. 1, is that the two channels 208 and 209 are spaced apart in order to assure that the opening of the channels may be fully closed by the diaphragm of the chamber 231. In order to assure that the volume of chamber 231 is fully emptied when moving the diaphragm 204, a groove is provided in the product space 231 which

runs from the vertex of this product space to the outlet orifice of channel 209. This is nowhere taught or suggested by any combination of the cited references. The rejection of claims claims 1-6, 8, 9, 11, 16, 17, 18, 21, 23 and 26-29 under 35 U.S.C. 103(a) as obvious over Nystroem (US 3.741,687) in view of either Getgheluck (FR 1,457,419) or Carver (FR 1,177,065) should therefore now be withdrawn.

Claim 24 stands rejected under 35 U.S.C 103(a) as obvious over Nystroem (US 3.741,687) in view of either Getgheluck (FR 1,457,419) or Carver (FR 1,177,065), as applied above, and further in view of Meloche et al (US 6,190,136). The Examiner cites Meloche et al for an elastomeric material. No elastomeric material will overcome the differences pointed out above, however. The rejection of claim 24 under 35 U.S.C 103(a) as obvious over Nystroem (US 3.741,687) in view of either Getgheluck (FR 1,457,419) or Carver (FR 1,177,065), as applied above, and further in view of Meloche et al (US 6,190,136) should therefore now be withdrawn.

Claims 1-25 stand provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-25 of copending application serial no. 10/600,299. An office action was issued for the '299 application on February 17, 2005, and Applicants intend to allow that application to lapse by failure to respond to the office action. This will resolve the double patenting issue.

In view of the present remarks it is believed that claims 1, 2, 4-20, 22 and 24-29 are now in condition for allowance. Reconsideration of said claims by the Examiner is respectfully requested and the allowance thereof is

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courteously solicited.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this response is required, Appellants request that this be considered a petition therefor. Please charge the required petition fee to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fee or credit any excess to Deposit Account No. 14-1263.

Respectfully submitted,
NORRIS, McLAUGHLIN & MARCUS

By _____
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WCG/tmo
Enclosures- 1 page Replacement Drawing Sheet (FIG. 3)
2 pages New Drawing Sheets (FIGS 9-10)
Internet Search Results 3 pages

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I hereby certify that this correspondence is being transmitted via facsimile, no (703) 872-9306. to the United States Patent and Trademark Office, addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 17, 2005.

By _____
William C. Gerstenzang
Date May 17, 2005